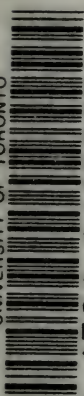


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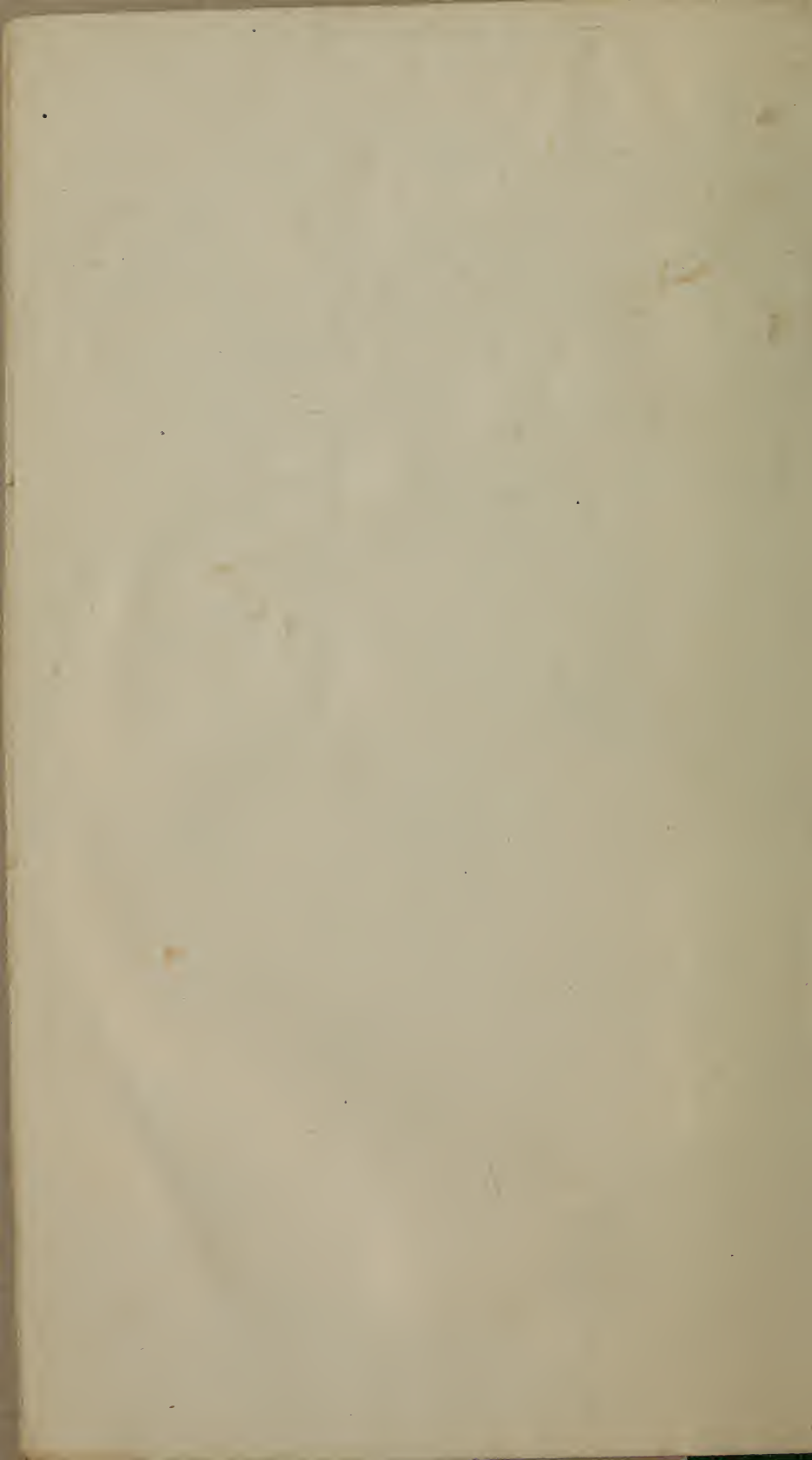
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A BOARD OF AGRICULTURE FOR IRELAND.

ITS NEEDS AND USES.

By RICHARD J. KELLY, B.L.

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A BOARD OF AGRICULTURE FOR IRELAND: ITS NEEDS AND USES.

Unless the conditions under which agriculture is pursued in Ireland are different from those which prevail in other civilised countries, and are more favourable to the industry than elsewhere, it would seem to require little argument to prove that the same means which every State takes for the promotion of the interests of its agriculture should be adopted and followed in Ireland. When America, with its vast resources, Denmark, with its restricted area, and a population engaged in agriculture of only 219,918 persons, and even Great Britain, with its exceptional devotion to Free Trade, find it necessary respectively to adopt measures for the protection and encouragement of their agriculture, surely Ireland, so largely dependent upon its agriculture for its prosperity, should more than any other country be generously provided by Government with the means of helping on its main industry, so that the occupation of farming may be rendered as profitable a pursuit as it is possible under modern conditions for it to be. With the growing increase of competition in all sorts of agricultural produce from abroad, in face of a rivalry so fierce and unrelentingly enterprising that it has invaded every department of domestic life, and competes with every product of the home farm, it becomes more than ever necessary for the Irish farmer thus so injuriously handicapped to be afforded some such aid at least as other countries afford their farmers. The alarming growth of this outside competition from these countries in food stuffs is evidenced by the fact that these imports increased in money value from £49,723,293 in 1895 to £52,800,083 in 1896, and they

continue to grow. In face of such significant facts everything short of Protection, which the farmers of other countries receive from their respective Governments, but which ours cannot expect, should be done for Ireland. As under the necessities of its manufacturing supremacy England will never consent to those legislative measures of protection in Ireland which its peculiar needs as a mainly agricultural country demands, and which all other countries adopt, to help their agriculture, it is not only expedient, but the duty of the English Government to do all it can indirectly to further agricultural interests in Ireland, and when it will not for its own sake give "protective laws," that it will at least give "productive money." Apart from these general grounds of justice common to all countries, there are some special reasons why the agriculture of Ireland should be especially and exceptionally assisted by the State in its struggle for existence against the elaborate and well provided institutions of all other favoured nations. These reasons may be summarised at follows :—

(1.) The large proportion relatively of the Irish population engaged in agriculture as compared with other pursuits, as shown by the following comparative statement :—

Country.	Total No. of persons returned as occupied.	No. and percentage of persons engaged in agriculture.
Great Britain (1891) ...	14,676,436	1,531,765 equal 10.4 per cent.
France (1891)	14,599,635	6,535,599 „ 44.8 „
Germany (1895)	20,771,090	8,156,045 „ 39.3 „
Belgium (1890)	1,857,885	646,252 „ 35.0 „
Denmark (1890)	681,952	219,918 „ 32.1 „
United States (1890) ..	22,735,661	8,446,843 „ 37.2 „

In Ireland in 1891 there were out of a population of 4,794,750, including 2,559,021 who were described as indefinite and unproductive, 936,759 engaged in agriculture, or 36.6 per cent. of the population. We find according to the census returns of 1891 that, as compared

with England and Scotland, the figures stand thus for Ireland:—

	England and Wales.	Scotland.	Ireland.
Farmers	223,610	54,332	417,003
Farmers' sons, nephews, &c., over 15	67,287	17,081	212,731
Agricultural labourers, farm servants, &c.	759,134	107,412	273,597
Shepherds	21,573	10,113	6,489

These figures show that as compared with England and Scotland, proportionately to the general population there are more persons engaged in agriculture in Ireland than there—the comparative figures being as 10 per cent. in Great Britain to 36 per cent. in Ireland. And the most significant of those figures are those relating to Denmark, where we find barely a quarter of a million of farmers not only feeding their own country, but exporting largely to feed others—the best evidence of the utility of State help.

(2.) The increasing number of Irish tenant farmers who are becoming through the aid of the State the owners of their holdings, and the consequently large sum of State money involved in the successful pursuit of their calling. The extent of these purchase operations will be realised by the fact that under the Purchase Acts from 1885 to 1888, 29,226 tenants purchased at a capital sum of £11,330,814, and since, under the 1891 and 1896 Amendment Acts, these transactions have so considerably increased as probably now to involve a capital little short of twenty millions.

(3.) The practice of other countries every one of which has its organisation State supported and controlled for the encouragement of scientific training in agriculture and the application to that industry of the latest researches in the related sciences, and of the latest discoveries and improvements generally.

(4.) The example and action of the Government in England itself in the establishment of a Board of Agriculture,

endowed from Imperial funds, and in various indirect attempts at legislative protection.

(5.) The creditable and marvellous growth of the agricultural organisation initiated by Mr. Horace Plunkett, which shows the surprising capacities of the Irish people for self help and organisation, and the possibilities of the developments of Irish farming properly endowed and helped.

(6.) The formal pledges and promises of the Government as conveyed in two Queen's speeches and one abandoned Bill for the establishment of a Board of Agriculture, and the solemn obligations under treaty to deal with the two countries similarly professed by every Ministry and observed by none.

(7.) The necessity from the standpoint of imperial defence that the United Kingdom, so largely dependent upon foreign food stuffs for its subsistence, should have at its very doors, and as a part of itself, at least one of the three islands where agriculture would be as highly developed as possible, and that the opportunity for utilising the peculiar aptitudes and inclinations of the Irish people for agriculture be availed of before the agrarian population by legislative neglect and consequent emigration is reduced to such an attenuated and impoverished condition that any improvement is impossible or any progress unattainable. The urgency of the latter consideration a few facts will show. The decrease of corn crops in the twenty-five years ending 1894 in the United Kingdom is 2,300,000 acres, or 3,730 square miles. In wheat alone there was a decrease of 1,793,435 acres from 1871 to 1894—an alarming decrease in the area of wheat equal to 2,800 square miles. Between 1870 and 1880 a decrease of corn crops of over a million acres took place, and between 1880 and 1890 a further decrease of more than another million acres. There was a decrease of 621,000 acres in green crops, chiefly potatoes. Little wonder such a condition of things—the result of free trade and of the neglect of agriculture—so alarmed the English people that it led to the establishment of its Board of Agriculture and other protective measures. As in proportion the same

decrease took place in Ireland, the same remedies ought to be applied.

These specific considerations, superadded to the general justice of the case for State help, should induce the Government to give to Irish farming that generous help which it is its right to demand and the State's duty to afford without any further wearying, wasting, and worrying delay. What form that help will take there seems among educated people no second opinion—that it should be in the form and on the lines followed by other countries—that is, the establishment of an organised body of expert opinion with an official machinery for carrying out its work; that that board should, while not too official in character, or overweighted with red tapeism, be of such a popular and elastic character, and in such intimate touch with the people that enable it from the start to secure and maintain their confidence and respect. That it should be a homogeneous and undivided body is also expedient, so that while working in harmony towards certain ends and a defined policy it may not be hampered by conflicting interests and narrow jealousies of rival and competing bodies. It is thought the new body should absorb all existing bodies, and form, for good or ill, one entire body with a responsible head, who may be a Cabinet Minister, or at least a member of Parliament, who will attend there to the various important interests of Irish agriculture, and be able to exercise that authority and control over boards and public bodies in the United Kingdom which will be found necessary for the furtherance and protection of the great interests entrusted to him.

An attempt has been made in England by the establishment of a Board of Agriculture to avert the decline of farming, and the statute book is being filled with measures tending indirectly to help agriculture ere it ceases to be an extinct industry. Much good has been done for the progress of farming in England by the Copyhold Acts. The enfranchisements which have taken place under them since 1841 to 1896 were 18,205, involving a sum for compensation amounting to £2,408,457. The Settled Land

Acts, 1882-90 (applicable also to Ireland), the Agricultural Holdings Acts, the Ground Game Acts (applicable also to Ireland, as are the Conveyancing Acts, 1881-92), the Small Holdings Acts of 1892, the Light Railways Act, 1896, the Destructive Insects Acts, the Contagious Diseases (Animals) Act, 1878-93, the Wild Bird Protection (Amendment) Act, the Finance Act, the Merchandise Marks Protection Act, the Locomotive Thrashing Engines Act, the Diseases of Animals Act, 1894, the Agricultural Rates Act, the Locomotives on Highways Act: all are measures intended to help farming interests, added to which is the most directly useful of all—the Board of Agriculture Act, 1889.

The Government that did so much in this direction, and the Parliament that sanctioned those attempts, cannot well refuse to extend to Ireland some measure of that aid it has given to English agriculture, and any proposal to do so should at least be equally generous and fair, and at the expense and out of the same imperial resources from which the English board was provisioned and financed, and towards which Ireland contributed more than its just share. Since 1889 the imperial exchequer has granted a sum of nearly a million towards working the British Board of Agriculture (the exact sum at £105,113 a year being £946,017). The direct grant during that period to Ireland has been £45,000, or some £5,000 a year.

It has been found now that “the do-nothing doctrine” of the Manchester school, which more than elsewhere was allowed such fatal scope of action in this country—the least suited of all to its adoption—can no longer prevail, and that in the department of agriculture, as elsewhere, it is the duty of the Government to actively interfere and protect endangered interests from the ruinous effects of a well directed and active foreign competition. The disastrous effects of the stupid, suicidal, and unpatriotic policy of inaction are seen in the decline of English farming, the alarming decrease of its products, the lessening attractions of the occupation for the people, so that we find that while the area of the United Kingdom,

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including the Channel Islands, is 77,671,319 acres, the returns show that in 1894 only 20 million acres were under cultivation, and that in permanent pasture an annual increasing quantity is given as $27\frac{1}{2}$ million acres ; leaving 27,370,000 for town areas and bogs, moors, lakes and mountains.

— One of the principal advantages of the establishment of a competent and efficient board of agriculture for a country such as this—whose main dependence is on its agriculture—would be the encouragement and aid such an organisation would give to the cause of agricultural education, practically by experimental farms and school plots, and theoretically by the cheap circulation and diffusion of useful and instructive information upon the particular kinds of plant suited to each district, the proper sort of cultivation which the soil requires, and the after treatment and disposal of the produce to the best advantage. This is the use and purpose of such bodies in other countries, as will be seen from the few examples I will give. Without some such aid it is impossible to expect permanent and enduring results. From mere individual spasmodic or ill directed attempts in this direction no good can come. Unless and until the Irish farmer is thoroughly trained in, and for the profession he adopts—as are the German and French farmers—it is idle to look for any substantial improvement in his condition or in the country generally, for farming otherwise will be, as it so largely is to-day, carried on in a precarious, haphazard manner. If there is one fact of international experience now absolutely indisputable it is that farming to be successful must be conducted on the most enlightened principles, with up-to-date experience to direct its developments. It is plain that the only hope of the industry lies more in what is called “intensive” than in “extensive” farming. Such is the case in Germany and America, and the recognition of that fact has made the well directed governments of these countries turn their attention towards educating the German and American farmers to the highest standard of efficiency. It has been found that side by side with one another the five acre

holding of a man who tills it scientifically is more productive than the twenty acre farm of the old style of worker. A very interesting report from the United States Consul at Crefelt, published by the American Board of Agriculture for the information of the cultivators of that country, gives such a striking instance of this system that I am tempted to quote a few lines in support of my argument that the only farmer who can expect to succeed under modern conditions of farming is the educated and trained agriculturist, and that the only way of bringing about that necessary condition of educational efficiency is by the establishment in Ireland, as exists in Germany, of a central controlling organisation, be it a board or department, but yet State controlled and endowed, whose object and purpose will be the systematic advancement of agriculture in every branch from the primary provision of schools and teachers to the ultimate aid of practical research by means of experimental station, model farm, or school plot. The German farmer works under the same conditions as the Irish farmer, with the exception that usually his land is not so good or so productive, nor has he his export markets so near at hand for the disposal of his produce, such as the big cities of England afford us. Although free of rent, the German farm is subject to a heavier burden of mortgage and taxation. Prussia is relatively thickly populated, yet, according to the American consul's words, what do we find existing there :—"How to produce much upon a small area is, therefore, the German farmer's natural lesson. Small farms, where cultivated with intelligence, are shown to have produced the best average results." A comparison is then made between two farms situated side by side, one containing ten and the other twenty acres. "The owner of the ten acre farm managed to procure from it a comfortable living for himself and family. The owner of the twenty acre farm, while working apparently much harder, and with double the investment in land, accomplished with less tidy accompaniments the same result. His labour was spread over twenty acres, while the labour of his neighbour was concentrated upon half that surface.

The owner of the ten acres farmed with his head and with his hands, while his neighbour followed the ways of his father and worked with his hands only. He had never investigated the ingredients of the soil he cultivated nor the elements of the fertilisers he spread upon it, and had no faith in what he heard regarding the possibility of saving tons of manure by putting his land in such condition that it would draw from the air and the clouds vital fertilising elements, and hold them as nourishment for the next growing crop. 'It seems to me,' he said, 'that only a crazy man can seriously expect manure to come down from the skies on his land. My neighbour talks about such things, and tells me that some crops draw from the air more 'stickstoff' (nitrogen) than others, and in order to secure the full benefit he advises me to raise upon the rotation principle certain crops here and others there, and to prepare the soil in this way and that. He says it is the natural way and very easy, and that if I give Nature a fair chance she will help me, and all that. The old ways, which I understand, are safest and best for me.'"

This German farmer is a common type. He did and wanted to do only what his father, with indifferent success, probably did. He will go in his footsteps, doing the things he did and knowing the things he knew and nothing more. Not having been trained to his craft, he does not believe in "book farming," even though its results are apparent and under his very eyes. The owner of the ten acre farm was a teacher in an agricultural school. He purchased his holding, then in an impoverished and exhausted condition. His previously acquired knowledge made him acquainted with the possibilities of the farm, and he throve while his neighbour the other side of the fence, with double his opportunities, was a failure. It is to encourage the growth of the class of farmer who so succeeded that the German Government is doing all it can through its excellent official machinery to promote industrial education. The system of agricultural school is so designed as to afford facilities for instruction for every class of student, from the highest

university course, extending over six years, to the lowest grade, suited to the labourer, who can only attend for a few weeks.

America, despite the splendid increase of its manufactures, is also up-to-date in its well-directed efforts to help agriculture. Although possessing a splendid soil and countless acres of yet uncultivated land, an increasing export trade in food, and an expanding population at home, and with other vast possibilities of industrial development, it can no longer with safety disregard the lessons of science and of human experience, and allow its agriculture to languish or lag behind. It appreciates the fact that those great natural advantages it has are useless, if not worse than useless, if the country must depend for their utilisation and its own prosperity upon ignorant, untrained, and unenterprising farmers. It has roused itself to an almost supreme effort to remove this reproach and danger. In the Congress of 1888, not to speak of previous and successive equally thorough efforts, a measure known during its progress through the House as "The Hatch Bill" passed, which appropriates annually a sum of fifteen thousand dollars in each of the States for the purposes of agricultural experimentation. The design of this Act is to afford additional instruction in the schools (except as this may be done by conducting experimental work directly under the eye of the student), but for purposes of investigation and experiment, and for disseminating the information so obtained among the people. The directions which the work may take are, says Mr. J. K. Reeve, multifarious—such as studying the diseases of crops, insect pests and their preventives, the chemical and cultural needs of growing crops, the action of fertilisers, the diseases of animals, the propagation of new and desirable varieties of grains, fruits, and vegetables; experiments with such as are indigenous to other lands, in order to determine if they may be profitably introduced, the restoration of fertility to exhausted soils, methods of best counteracting the effects of drought, and again in intensive methods of cultivation and the growing

of specially valuable products. This is a range and reach of possibility, as results have proved, not extravagant and the effect of the system is that after some years the farming of the States has kept in the front rank. The statistical agent of the American Agricultural Department recently reported that the average income of farmers in the New York State in 1886 was only $3\frac{1}{2}$ per cent. upon their capital invested, and then without any allowance for their own time and labour. These small profits did not daunt their efforts to improve their land, and they have since succeeded in increasing their earnings, but only by adopting a system of more thorough cultivation and better principles of farming.

The general application of scientific knowledge and exact methods to the business of agriculture will never generally be found to prevail in any country until it first has a class of men thoroughly educated in the theory and practice of agriculture—men who will carry into the processes of the farm the teaching of the school; or, secondly, “men who, being fitted by education and training for business or professional life, yield to the superior inducements which agriculture undoubtedly offers, and take into that field their methodical and intelligent habits, and supplementing these by reading, study, and practice, devote their talents to the furtherance of its development.” In the practical carrying out of that recognised principle there are now 48 colleges and universities in nearly all the States of the Union, which are either organised in consonance with the Act of Congress of 1862 or which having their organisation prior to that, were subsequently beneficiaries under the Act, and are mainly indebted to it for their present existence and financial support. This Act, says an authority, differing from most legislation in the fact that it was materially in advance of public sentiment, granted a large amount of the public lands to the respective States for the purpose of establishing colleges where the leading objects should be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanical arts.

Besides these endowed institutions there are in the United States 42 other schools of science, in some of which agriculture is a leading feature, and in most of which special attention is given to the related sciences. The methods of work and instruction at the different schools vary according to the policy deemed best by the controlling powers, but the general object aimed at is "to give a thorough practical knowledge of agriculture, and at the same time liberally educate the man." Class room instruction embraces particularly those sciences and the kindred arts, such as chemistry, horticulture, botany, zoology, physiology, and veterinary medicine and anatomy, and in order to effect a symmetrical training, these are supplemented by such studies as history, mathematics, book-keeping, political economy, logic, landscape gardening, and civil engineering, while the classics and abstruse sciences are usually elective. This is further supplemented by laboratory work, and in many cases by actual compulsory labour upon the farm or in the gardens, while the solutions to knotty questions are worked out by the aid of the hoe or the pruning knife. In the principle underlying the intensive mode of cultivation, or, in other words, the system of getting an acre of land to produce what it can, lies undoubtedly the future profitableness of farming carried on in any country, either in the protected United States or in the free trade United Kingdom.

The result of the establishment at centres of education and learning of means and machinery of experiments have led to marked results in America, and the money value of the information thus acquired to the country it would be impossible to estimate. The interesting series of experiments made at Colorado Agricultural College by Professor Blount with the sowing and growing of wheat, are worth in themselves and in the saving of seed they effect all the cost of the department to the States. The saving alone, if these results are accepted, is something like fifty million bushels of wheat needlessly thrown into the ground. If under similar State encouragement in Ireland we had scientific investigation into and experiments upon the present wasteful system of sowing all sorts of

seeds, how beneficial would be the results ; but neither here nor in America could such experiments be attempted were there not an organised State department to inspire, stimulate, and aid them in the first instance, and, when made, to circulate the results and make them as generally known as possible ; not drawn out as individual efforts, liable to error, mistake, and miscalculation, but as the proved, exact, and verified results of scientific investigations carried on by recognised public officers in the service of the State ; and until we have some such like means of education in experimental farming and in the theory and principles of agriculture we can never expect our farmers to profit by the industry as they might, or to keep abreast of the fierce competition that encounters them in every line of their business and upon every side they turn.

Probably the best way to understand the possible utilities of any Act establishing a Board of Agriculture in Ireland is to describe the scope and character of the English Act—not that the circumstances of the two countries, or the condition of agriculture in them, are the same, or require exactly the same treatment, but with a view to understanding what are the advantages of that measure, and what use has been made of it in the promotion of the interests of this important industry. Before describing the action taken in this direction in other countries I shall give a brief account of the English Act ; as, while it may not suit the state of things calling for relief in Ireland, it is more likely to be followed in its chief provisions in the framing of an Irish Act than the adoption of any of the more thorough and radical measures of relief followed by the other countries with which I purpose to deal.

The Act for establishing a Board of Agriculture for Great Britain obtained the Royal assent upon the 12th of August, 1889. Section 1 provides that there shall be established a Board of Agriculture, consisting of the Lord President of the Council, her Majesty's principal Secretaries of State, the First Commissioner of her Majesty's Treasury, the Chancellor of her Majesty's Exchequer, the Chancellor of

the Duchy of Lancaster, and the Secretary of Scotland, and such other persons, if any, as her Majesty the Queen may from time to time think fit to appoint during her Majesty's pleasure; provided that the board shall not be entitled to act unless the president, or one of the officers of state above mentioned, is present. Sub-section 2:—

"It shall be lawful for her Majesty the Queen from time to time to appoint any member of the Privy Council to be president of the board during her Majesty's pleasure," and sub-section 3 says the "board shall be deemed to be established on the appointment of the president thereof."

Sub-section 2 of section 2 enacts:—"The Board of Agriculture shall also undertake the collection and preparation of statistics relating to agriculture and forestry, and may also undertake the inspection and reporting on any schools which are not public elementary schools, and in which technical instruction, practical or scientific, is given, in any matter connected with agriculture or forestry, and the aiding of any school which admits such inspection, and, in the judgment of the board, is qualified to receive such aid; and the aiding of any system of lectures or instruction connected with agriculture or forestry; and the inspection and reporting on any examinations in agriculture or forestry." This was a most useful provision, and under it a great deal of good has been effected by the board. The extension of such useful powers to a central body in Ireland, specifically appointed for the purpose, would be a matter of great public advantage.

Sub-section 3 of section 2 say:—"The Board of Agriculture may also make, or aid in making, such inquiries, experiments, and research, and collect, or aid in collecting, such information as they may think important for the purpose of promoting agriculture or forestry." Section 3 says:—"The Board of Agriculture may, from time to time, make such general or special orders as they think fit for the following purposes, or any of them, that is to say:—

"(a) For prescribing and regulating the muzzling of dogs, and the keeping of dogs under control; (b) for

prescribing and regulating the seizure, detention, and disposal (including slaughter) of stray dogs, and of dogs not muzzled, and of dogs not being kept under control, and the recovery from the owners of dogs of the expenses incurred in respect of their detention; and the Contagious Diseases (Animals) Acts, 1878 to 1886, shall apply as if the said purpose were among the purposes mentioned in section 32 of the Contagious Diseases (Animals) Act, 1878."

Section 5 deals as follows with the staff, their remuneration, and the expenses:—" (1) The Board of Agriculture may, from time to time, appoint a secretary and such officers and servants as the board may, with the sanction of the Treasury, determine. (2) There shall be paid out of the money provided by Parliament to the president, if not, one of the officers of State above mentioned or any other officer of State receiving a salary, the annual salary of £2,000 a year; and to the secretary, officers, and servants of the board such salaries or remuneration as the Treasury may from time to time determine. (3) All expenses incurred by the Board of Agriculture in the execution of their duty under the Act, to such amount as may be sanctioned by the Treasury, shall be paid out of money provided by Parliament."

The latest returns of parliamentary grants show that the costs of the Board of Agriculture in England last year were £105,000, to which, as it comes out of the imperial funds, all ratepayers contribute, and Ireland more than its fair proportion. It is but fair and just, therefore, that the funds which may be found for the establishment and working of an Irish Act should, as does the English Act, come out of the imperial resources, and not, as the abandoned Act of last year meanly proposed to do, be given from some of the already starved Irish service.

Section 8:—" (1) The office of President of the Board of Agriculture shall not render the person holding the same incapable of being elected to or sitting or voting as a member of the Commons House of Parliament, and shall be deemed to be an officer included in Schedule H of the

Representation of the People Act, 1862; Schedule II of the Representation of the People (Scotland) Act, 1868; and Schedule E of the Representation of the People (Ireland) Act, 1868. (2) The President of the Board of Agriculture, if not one of the officers of State above in this Act mentioned, shall take the oath of allegiance and shall be deemed to be included in the first part of the schedule to the Promissory Oaths Act, 1868."

Section 9 deals with certain transfers as follows:—"(1) There shall be transferred and attached to the Board of Agriculture such of the persons employed under the Privy Council or any other Government department, in and about the execution of the powers and duties transferred by or in pursuance of the Act, to the Board of Agriculture as the Privy Council or Government department, with the sanction of the Treasury, determinate. (2) There shall be transferred and attached to the Board of Agriculture all persons employed under the Land Commissioners for England. (3) The Board of Agriculture may, from time to time, distribute the business of the board amongst the several persons transferred in pursuance of this Act, in such manner as the board may think right, and those officers shall perform such duties in relation to that business as may be directed by the board; provided that such persons, while they continue in office, be in no worse position as respects their tenure of office, salaries, or superannuation allowances than they would have been in if this Act had not passed. (4) Any Order in Council made in pursuance of this Act which transfers any powers or duties to the Board of Agriculture shall extend this section to the persons employed in or about the execution of these powers and duties."

Section 10 deals with the ultimate abolition of the Land Commissioners; section 11 with the construction of the Acts and documents; section 12 with the definitions, and section 13 repeals certain Acts; and the final section, 14, gives the short title of the Act as the Board of Agriculture Act, 1889. They are all too formal and technical to be reprinted, as they do not affect the general principles and

working of the Act. Sufficent has been given of the scope of the statute to show how wide reaching its powers and duties, and how—adopting the name, plan, and outline for an Irish measure—much of advantage could be effected.

Having explained briefly the chief provisions of the English Act for the establishment of a Board of Agriculture, it remains but to state that incorporated with it were a number of Acts relating to the duties of the department and which conferred upon the new authority large powers of dealing with all matters in any way bearing upon the general subject. In this connection there are a number of adopted Acts—in fact, every measure is incorporated that could conceivably be found to bear upon the question of Agriculture. Perhaps one of the most useful of its many beneficent results was the establishment of a central chartered body of the character, status, and resources of a State Department, the object and purpose of which were to give every aid, encouragement, and incentive to agriculture. In this respect much satisfactory progress has been made. Through the co-operation of the County and Parish Councils technical instruction is given as applied to the land. As a consequence, at this moment in every county in England and Wales, except Middlesex, systematic teaching in dairying has been established, or is projected by the County Councils acting through the central board. Lectures and demonstrations on horticulture, poultry keeping, and farriery are now being given in many counties as part of the regular course of technical training. Manual instruction in the various processes of agriculture is taught in other counties. Elementary teachers are being trained, and evening classes and continuation schools and science classes are spreading in every rural district under the encouragement given. Middle class schools are not unmindful of their obligations, and in this respect are taking up the subject of agricultural education with the same zeal and energy, and everywhere with the most encouraging results.

In Scotland throughout most of its counties the same advance in agricultural education is manifested—the same energy is displayed in its promotion. In twenty counties

of England and Wales demonstrations by experimental work in field plots are now being carried out, and probably no better means of instruction could be devised. Most of these latter works of practical teaching are carried on entirely out of the local resources, thus showing the determined desire of the local authorities even in those trying times to do their part in the noble work of furthering the cause of agriculture. Without the incentive of a central board these local efforts would be ineffective, but under its inspiration and encouragement they are possible. Until the establishment of the Board these attempts were not made, and we can well imagine how far more general and liberal these exertions would be if the conditions under which agriculture is being pursued were more favourable. At any rate, there is some certainty that the uprising generation of English, Welsh, and Scottish farmers and labourers will be an educated, thoughtful, and trained body of men, and as such better fitted than otherwise to carry on successfully their precarious profession.

Thus, in every village through the stimulative agency of its local authority a new spirit of technical education in agriculture is spreading, while in centres a higher course of instruction is pursued in the colleges and universities. The arrangement at present is to have certain selected teaching centres, usually by preference existing colleges, and to these are given grants by the Board of Agriculture for the encouragement of agricultural education in these institutions. This instruction is carried on in a most thorough and systematic manner, and is certain to prove beneficial in its results. I shall take for example and illustration four instances out of many. (1) At the Durham College of Science in Newcastle-on-Tyne a course of lectures is given in agriculture, forestry, entomology, land surveying, animal anatomy, and physiology. The composition fee for the complete agricultural course averages £21 per annum. (2) At the University College, Aberystwyth there are (a) a director of agricultural education and two lecturers in agriculture, (b) a professor and assistant professor and demonstrator in

chemistry, (c) a professor in physics and assistant lecturer and a demonstrator, (d) a professor of biology and geology, and a lecturer and demonstrator, (e) an assistant lecturer in veterinary science, (f) an instructor in agricultural drawing and building construction. The two years' curriculum in Agriculture there qualifies for the college certificate of associate, and provides preparation for the senior examination of the Royal Agricultural Society of England and other similar examinations. The composition fee is £18 a year for the entire agricultural course. There is a well equipped department of agricultural chemistry and a permanent dairy school. There are special scholarships for agriculture and dairying, and excellent arrangements for the residence of women students in the hall of residence. (3) In the University of North Wales at Bangor there are (a) a complete course in theoretical and practical agriculture, extending over two years, and suitable to farmers and land agents, (b) an advanced course for a third year in agricultural chemistry, (c) a one year's course, consisting of a selection of classes from the two years' course, (d) a short course of eleven weeks, commencing in October, and consisting of agriculture, chemistry, book-keeping, and land surveying. The degree of B.Sc. in agriculture of the University of Wales may be taken by students who successfully pursue a third year's course of study at the college. (4) At the Royal Agricultural College and Farm at Cirencester, which gets no grant and is self-supporting, practical and scientific instruction is given in agriculture, dairy farming, and estate management; also practical carpentry, smith and forge work are taught.

To carry out these works of education the Board of Agriculture give as grants to the colleges an annual sum of £8,000, which is distributed as follows:—

University College of North Wales, Bangor—Collegiate centre, £800.

Yorkshire College, Leeds—Collegiate centre, £800.

Durham College of Science, Newcastle-on-Tyne—Collegiate centre, £800.

University College of Wales, Aberystwyth—Collegiate centre, £800.

University Extension College, Reading—Collegiate centre, £500.

Cambridge and Counties Agricultural Education Committee—Collegiate centre, £400.

University College, Nottingham — Collegiate centre, £250.

Eastern Counties Dairy Institute—Dairy instruction, £350.

British Dairy Farmers' Association—Dairy instruction, £300.

Bath and West and Southern Counties Society—Special cheese and cider research and agricultural experiments, £400.

Glasgow and West of Scotland Technical College—Collegiate centre, £650.

University of Edinburgh—Collegiate centre, £550.

University of Aberdeen—Agricultural instruction, £100.

Scottish Dairy Institute, Kilmarnock—Dairy instruction, £300.

Highland and Agricultural Society—Agricultural experiments, £150.

Aberdeen Agricultural Research Association—Agricultural experiments, £100.

Class for the instruction of working foresters and gardeners in the Royal Botanic Gardens, Edinburgh, £150.

To enable this money to be best spent, the provincial or several county centre system is, as far as possible, adopted and encouraged, as, of course, the grouping of counties enables the work of teaching to be carried on more efficiently and economically than would be possible if each separate county depended upon itself for its own separate means of training. Major Cragie, in referring to this method of concentration, so aptly describes its advantages and so well epitomises its benefit that I give the results in his own words:—"Some of the leading features in which it has been found that agricultural centres are likely to prove of special value to agricultural education in all its

bearings are as follow:—1. The technical training of teachers mostly engaged in elementary schools who are capable of giving instruction to lads in evening schools and classes. 2. The provision of experts for giving courses of instruction in particular branches of practice, such as dairying, horticulture, poultry keeping, and the like, together with convenient arrangements for the necessary supervision of the instruction so given. 3. The provision of instruction to actual farmers in those matters of a semi-scientific, semi-practical character which are now usually classified under the head of extension lectures, and which comprise such subjects as the economic use of artificial fertilisers and feeding stuffs, the methods of preventing or mitigating the attacks of injurious insects and other pests affecting farm crops, the hygiene of the farm, and the treatment of stock in health or disease. 4. The conduct of stations of field demonstration and experiment, whereby farmers are shown on their own farms the action of different manures, and are taught by means of lectures how to discriminate between them, and to choose and purchase those which are calculated to give the best return to the crops for which they are intended. 5. The provision at the college centre of such continuous courses of scientific instruction as are likely to be of educational value to the sons of farmers of the district, at a cost within the reach of the class for which they are intended. 6. The provision of means for personal intercourse between the head of the agricultural department of the local college and his staff and the farmers in the neighbourhood, so that the college may become the place to which the agriculturists of the district will naturally turn for information and assistance in every matter of a scientific character bearing in any way upon their practical work. 7. The provision in each locality for the benefit of the local authorities of a body of scientific experts, whose services may be available, either for instruction or for consultation, at a cost much below that which an individual council would have to pay if it were to attempt to set up an institution of similar character in its own area."

It is impossible to overrate the advantages of the plan of county co-operation described by Major Cragie, and adopted in England. When cordially carried out for a common purpose it tends to the common efficiency of arrangements, and contributes to their economical administration—a consideration which cannot be disregarded. The combined areas are in no single instance allowed to become too large, unwieldy, and unworkable, and when that objection is found to prevail it can very soon be remedied. The present prevalence of the arrangements shows their popularity and utility. The same desire for technical training in agriculture has, needless to say, shown itself in Scotland, and in the centre, south-west, and south-east the movement has spread. In Wales all the counties have adopted the system, and so have the three ridings of Yorkshire for the counties of the north, as also the counties of Berks, Oxford, Hants, in the Thames Valley; and in a less perfect form in the east midland and eastern counties.

Every year sees an extension, but so far the plan of grouped counties prevails. The county councils are working in their lines towards the same object with remarkable energy and spirit, and as proof of what these local authorities have done, and can elsewhere do, I give a few instances :—

The Essex County Council, through their technical instruction committee, offer scholarships to enable farmers' sons or other suitable candidates to attend a course of lectures or instruction at agricultural schools which the committee may select for the purpose. The instruction committee also notify that they are ready to receive pupils for instruction in butter and cheese making at their county dairy school at Colchester. This has been successfully carried on for several months. In Suffolk the technical instruction committee of the county council, in addition to grants for instruction, had their elementary teachers recently trained at Ipswich in a regular course of chemistry and agricultural botany, and visits were arranged for them to the experimental farm plots at Warminster

and Bramford. In Cheshire the county council in its dairy instruction alone did very good work, not only in training its particular pupils in that very necessary science of butter and cheese making, but in stimulating throughout the country generally a greater zeal for better standards. At a moderate cost it trained last year 155 pupils, and its experimental farm only cost the county £200. Other counties in England are following in the wake of Cheshire, and have established dairy institutes everywhere with the most gratifying and encouraging results; and the work of technical training is spreading into every part of the country. These object lessons in instruction are excellent and effective means of education; for thereby can be seen carried out into practice the theories of agricultural science, which otherwise would not be so efficacious and lasting in their effects. In fact, without the aid of experiment to illustrate and supplement the teaching, it is difficult to conceive how mere dry book learning, however excellently imparted and intelligently conceived, could be of the educational value intended and required.

The grants ran from £2,930 in 1888-9 to £7,400 in 1894-5, and judging from their gradual and steady growth, I may fairly anticipate a further increase in probably the best distributed money voted by Parliament. Its apparent inadequacy and insufficiency as compared with the grants made by other less wealthy countries in the same desirable direction is the only comment I should be inclined to make upon the matter, and one certainly cannot quarrel with such a judicious distribution and allocation of public money or question the utility of the purposes for which it is given. In this country, where nothing of the kind occurs where such useful means of popular training in our only industry as field and other practical experimentalism is never dreamt of or perfunctorily performed through want of State aid, by the directors of our national education; where none but antiquated and almost useless books on agriculture or its related sciences, relatively to the advanced, up-to-date character of those adopted in continental schools, are in the hands of our youth, and where

practice or concrete experimentalism is never attempted upon any improved plan to illustrate the lessons imparted, it is hard to expect that such perfunctory and ill directed attempts at instruction can be of any real advantage or lasting utility. It is idle to look for substantial results from this haphazard system, or that the experience of other governments in this direction can be here disregarded and thrown aside as useless or antiquated in these essential matters.

When everywhere else a regular course of instruction by lectures and teachings in all the sciences bearing upon agriculture and in agriculture itself is instituted, and experimental farms are established; when every effort is made to make the French, Danish, German, American, and even now the English farmer, thoroughly educated in his art, we may well pity the condition in which ours find themselves, and we can form some idea of how heavily handicapped Irish farming is against the relentless competition of the much favoured and well trained farmer of every other civilised country.

For many obvious reasons we in Ireland take comparatively more interest in the life and doings of our exiled kith and kin in America than in the concerns of any continental power, and therefore before describing what is done in the principal European countries in the direction of protecting and aiding agriculture, I shall first explain the measures taken by the United States to help the American farmer. There is another reason, apart from any fellow feeling, why this country in this respect more deeply interests us, and that is that from it we experience our most intense rivalry, and from it competition comes in its keenest form. In America, State action, so kindly, so constant, or paternally protective, contrasts markedly with the stepmotherly indifference with which agricultural matters are treated and agriculturists are dealt with by the British Government in this part of the empire. Probably it will be said by some latter-day politicians that America is lamentably behind this economic age as understood in England in this respect, and that she is transgressing the laws of

that dismal science which alone in England are held so sacred ; but the marvellous advancement of America in material wealth is a sufficient answer to this argument. In America there are higher "ideals of duty" among its public men in regard to its agriculture than prevail here, and, as a happy result, that industry has been kept prosperous. From the first moment when the great problem of encouraging and assisting the farmer presented itself for consideration to Congress, when land skimming gave way to land culture, it was faced. When the New England forests were cut, the fair fields of Virginia exhausted, the fertile valleys of Central New York "tried and passed" the conquest of Kansas, Nebraska, and Montana effected, and the pioneer farmer came face to face with the agriculture of the Pacific slopes. During all the time he planted his seed and gathered his crop without giving a thought to the destruction his methods were bringing upon the fertility of the soil, and when exhaustion meant only a new location for him, the farmer wanted nothing. But that stage has been long since passed, and the American Government is for some years face to face with agriculture actually pursued under almost the same limitations as elsewhere. Then at once its duty of protection and assistance arose, and it liberally did that duty. At that period it established its department of agriculture, generously subsidised it, and each year it enlarges its scope of activity, its range of action, and possibilities of usefulness. It recognises in its farming its greatest industry, knows and feels that all other industries are but subordinate to that, the first and best of all, and so regarding it, no false economic laws sanction indifference to such prime interests or tolerate neglect of the supreme law—the preservation at all costs of its cherished agriculture.

Among the most important Acts of Congress touching the welfare of the American farmer are those which provide for the establishment of institutions of learning, which are to give special attention to agriculture and the sciences related to it, and for the maintenance of agricul-

tural experiment stations, which are devoted to the scientific investigation of agricultural problems. I shall just deal with five main matters in which the American Government, through its excellent Department of Agriculture, fosters and protects farming. Firstly, by reciprocity treaties giving the farm produce a fair market, and finding for it the best openings; secondly, by its legislation protecting manufactured butter; thirdly, by its weather bureau or system of gathering and circulating reports concerning the weather and the climate of the several States; fourthly, by its direct encouragement of the cultivation of the sorghum plant, and through it the sugar industry; and, fifthly, by its inspection of live and dead meat.

As regards reciprocity—a line of conduct ridiculed in England—America with its splendid practical common sense recognises no such pseudo scientific nonsense as prevails here under the guise of free trade, which seems in action giving liberty to every rivalry and competition to kill out the agricultural industry. By the M'Kinley tariff, under schedule 9, devoted to "agricultural products and provisions," it provides duties on live animals, breadstuffs, farinaceous substances, dairy products, farm and field products, seeds, fish, fruit and nuts, meat products, salt, and miscellaneous products. Other schedules provide duties on wool, lumber, tobacco, spirits, wines, flax, hemp, jute, and leather. The duties on sugar vary from seventenths of a cent to 2 cents per pound; on molasses, 4 cents per gallon; on coffee, 3 cents per pound; on tea, 10 cents per pound; on hides, $1\frac{1}{2}$ cents per pound. These provisions were intended to secure trade privileges in return for the free admission of certain products into America. Treaties were concluded with several countries for the purpose, that with Brazil for admitting American wheat or any of the other products of the American fields or any agricultural machinery. In every one of these inter-State transactions the object of the American Government has been to find a market for the agricultural and manufacturing products in return for some compensating advantages it offers the other contracting countries.

The law dealing with oleomargarine passed in 1886 is far more effective and thorough than the British attempt to restrict the free sale of margarine. The American Act defines butter, and imposes a tax upon and regulates the manufacture, sale, importation, and exportation of oleomargarine. It lays a special tax of 600 dollars upon manufacturers, of 480 dollars upon wholesale dealers, and 48 dollars upon retail dealers. A stamp tax of two cents a pound to be paid by the manufacturer is assessed upon every pound and upon every packet containing a fraction of a pound. It provides for exportation free of tax, and subjects imports to an internal revenue of fifteen cents per pound in addition to any customs duty. Each packet is to be worded, stamped, and branded as prescribed by the Commissioners of Internal Revenue. Severe penalties are imposed for manufacturing or selling without paying the proper tax, and for failing properly to label packages. The law protects the butter maker more than it prohibits the manufacture of the substitute. It deprives the latter by its tax of the relative advantages of cheapness, and it protects consumers from the competition of oleomargarine under the name of butter. The industry has nevertheless increased, but the price of good butter has been raised and in the poorer grades an improvement effected. Compelling it to be sold under its own name, it has relieved the product of the reproach of being a fraudulent article, giving it (as Mr. Harris, an American writer, expresses it) an honourable position in commerce as a legitimate means of utilising waste products, and as a cheap, wholesome substitute for an expensive necessity.

The weather service of the United States was, up to 1890, under the War Department of that country, but it was then transferred to the Department of Agriculture, of which it became a bureau. In addition to the general predictions from Washington, local predictions are arranged, and an efficient staff of local officers are appointed, whose forecasts will assuredly be of special utility to farmers in their respective localities. In addition to this duty, the weather bureau will undertake the study of the

problems which lie in the common domain of meteorology and agriculture. Systematic studies of climate are to be undertaken ; for it must be remembered that it is the climate more than the soil that gets a particular crop for a particular district. It is as much climate as anything else that renders the peach cultivable in New Jersey and Delaware, the orange in Florida and California, corn and wheat in the north, and sugar cane, tobacco, and cotton in the south. The meteorological conditions most favourable to the growth of individual plants will therefore be studied and the results of the experiments made known to those interested. Thus, it has been found already through these experiments that the cotton plant requires, in the earlier part of its growth, plenty of warmth and moisture to develop stem and foliage, while in the latter period of its growth less moisture is desirable in order to favour full and early development of seed and lint. The discovery and development of these facts alone are most invaluable, and calculated to be worth to the country the whole cost of the department.

In the Act of 1891, making appropriation for the United States Department of Agriculture, "any manufacturer of sugar from sorghum may remove from distillery warehouses to factories used solely for the manufacture of such sugar, distilled spirits, in bond, free of tax, to be used solely in such manufacture." "All distilled spirits when so used may be recovered by re-distillation." For a number of years the Department of Agriculture has been conducting experiments of making sugar from sorghum, which is a Chinese sugar cane (a cane like grass) containing large quantities of sugar—a ton containing 200 pounds of sugar. The ground extends over a large area, including Southern Kansas, Oklahoma, and Texas.

I next consider the efforts made by the secretaries of American agriculture of successive administrations, whether Democratic or Republican, to protect the export trade in live and dead meat, and to adequately meet the hostile restrictions of other countries. There is an inspection of live stock and meats before export. The

veterinary inspection of neat cattle and sheep to be exported is made at a number of interior cities and at sea-ports. The cattle when so found free from disease are tagged and shipped, and railroad companies are obliged to furnish clean and disinfected cars. Persons who ship live stock must give the name of the place from which the animals came and the name of the feeder, to enable the bureau to trace diseases to their origin. The city inspector forwards to the port inspector the tag numbers, and a description of the cars in which the animals are railed. No more than a proper proportion are allowed on board, and no vessel can receive clearance papers until the veterinary inspector certifies to the collector at the port that the law has been complied with. Slaughter and packing houses are inspected, and an inspector appointed who must have free access at all times. Carcasses of diseased meat are branded with a numbered tag and a record kept at the department at Washington. Each package of food product is labelled with a label which bears the department number of the establishment, and the statement that the article has been examined. A copy is filed in the department for identification. Further, each package shipped must have printed on it the department number of the establishment, the location of the factory, and the number of pieces or pounds contained, the trade mark, and, in large letters, the words "for export" or "inter-State trade," and shall bear a Department of Agriculture stamp. For each consignment of carcasses or their food products exported the department gives a certificate, stating the number of the factory, the name of its owner, the date of inspection, the name of consignee, the country to which the articles are to be exported, and the numbers of the stamps attached to the articles. The certificate is in duplicate, one copy being delivered to the consignor, one attached to the invoice, and one filed in the Department of Agriculture. There is also provision made for the microscopic examination of pigs at the time of slaughter, to detect any traces of trichinosis. When the slaughtered hog is passed into the cooling room three samples are cut

from the body—one from the pillar of the diaphragm, one from the underloin, and one from the shoulder. These are marked, placed in self-locking boxes, and sent to the microscopist. The cost of inspection is borne by the Government; and in the report of 1891 the Secretary of Agriculture writes that it had cost, for the ten months it was then in operation, 8,500 dollars per month, and that the meat inspection, when it had been in operation three months, then cost about $3\frac{1}{4}$ c. per head; but the cost in both respects has been since considerably reduced. As a result of the inspection arrangements, the dead pig of America is now admitted free into all countries, even the most critically careful, where it was previously vigorously restricted; and this success alone more than justifies the cost of the experiments and of the Department of Agriculture itself.

I have already referred to the number of special institutions established and endowed for the teaching of agriculture in all its branches. As an example of the thoroughness and excellence of these educational arrangements, I will just briefly describe the course of teaching last year at the College of Agriculture at Columbia in Missouri. The winter course began on January 2, and continuing daily, except Sunday, concluded on March 26. It is designed to meet the wants of those who cannot afford a college course in agriculture, and yet desire a better preparation for their life work than can be acquired on the farm. It is given in winter, as boys can be then more easily spared; it is open to all over sixteen years of age, and requires no entrance examination or special preparation. It is the aim to give the student the largest amount of thoroughly practical information about farming, dairying, fruit growing, veterinary science, carpentry, and blacksmithing possible in the twelve weeks allowed, and at the same time to instruct him in the elements of chemistry, geology, and botany as applied to agriculture and horticulture. The instruction is imparted by means of lectures and practical illustrations on the farm, in the barn, in the greenhouses, the laboratories, and machine shops of the college.

The course consists of 150 lectures, divided into these sections:—Agriculture (50 lectures), horticulture (40), agricultural chemistry, plant physiology, and sanitation (30), economic entomology (10), book-keeping and farm accounts (10), exercises in carpentry and blacksmithing, veterinary and veterinary science (20 lectures). Taking the first section—that of agriculture—we find the following matters exhaustively treated of, namely:—

Farm Equipment—Five lectures. Plans for horse and cattle barns; pig, sheep, and poultry houses, silos; road construction and fences; farm implements and machinery. Each student is expected to prepare floor plans of all building required on his farm, to make a bill of material, and an estimate of the cost of their construction. By Professor Mumford.

Farm Crops—Ten lectures. The history, distribution, place in rotation, cultivation and treatment, and the time and method of harvesting the leading farm crops; selection of seed; detection of weed seeds and identification of common weeds. By Professor Mumford.

In Breeds and Breeding—Fifteen lectures are given by Professor Mumford. A discussion is given of heredity, variations, selection, in-breeding, cross-breeding, grading, &c., and a study made of the different breeds and their adaptability to various conditions. There is practice in scoring and judging the leading breeds of cattle, horses, sheep, swine, and poultry.

In Drainage—Five lectures. Practical details of farm and road drainage; levelling and locating drains; size and depth of drains; cost, profit, and effect of drainage; machines and appliances for drainage.

In Manures—Five lectures. The best method of preserving and applying farm manures; the relative value of the different manures and fertilisers; the maintenance of soil fertility; the estimation of the value of different kinds of commercial fertiliser, and of lime, plaster, &c.

In Stock Feeding—Ten lectures. The composition and digestibility of feeding stuffs; the preservation and preparation of coarse fodders; hay making; ensilage; steam-

ing and cooking food ; feeding standard, and the calculation of rations ; growth and fattening ; feeding for milk, wool, &c. ; effect of food upon the quality of the meat, wool, and milk and butter ; practice is given in computing and compounding balanced rations for the various purposes named.

In Dairying—This course treats of the constitution of milk, conditions affecting creaming and churning, different methods of milk testing, preservation of milk and butter, the ripening of cream, the causes of its souring, the sources of infection of milk, and the modern methods of preventing the spread of this infection.

In addition to these lectures, the students are given practical work in a well equipped dairy from 10.30 a.m. to 4 p.m. for a sufficient length of time to give experience in the details of handling and sampling milk ; in creaming by the ordinary methods, and by the use of various styles of hand centrifugal separators ; in the handling and ripening of cream ; and in churning, washing, salting, working, printing, and judging butter. They are drilled each day during this time in all the operations of a practical working dairy, handling from 500 to 600 pounds of milk daily. This work is done under the personal supervision of Mr. John Patterson, of Kirksville, Mo., president of the Missouri State Dairymen's Association, a practical and a successful dairyman and an expert butter maker. In the dairy practice is also given in milk pasteurisation and in preparing pasteurised milk for market. Daily practice in the manipulation of the Babcock test, in testing whole milk, skim milk, buttermilk, and cream, in the detection of wastes and adulterations is given during the two weeks of dairy work, under the supervision of Mr. Conner. All machinery and apparatus used in the dairy work is new and of the latest and most approved patterns.

In Horticulture—Forty lectures are divided into these subjects :—Construction and management of hotbeds and cold frames ; propagation of plants, including germination of seeds, making cuttings, budding, grafting, and layering ; pruning and cultivating orchards and small fruits, and

spraying for insects and fungous diseases, originating and improving varieties of fruits and vegetables by cross fertilisation, selection, and cultivation.

A short course is offered in book-keeping and farm accounts, in which the student will be able to gain a correct knowledge of the elementary principles of book-keeping, with thorough drill and practice in different forms of farm accounts, letter writing, &c.

A study is made of the anatomy and physiology of domestic animals; lameness from sprains and from bony growths; treatment of fistula, poll evil, wounds, indigestion of the stomach and bowels, constipation, colic, diarrhoea, catarrh, bronchitis, congestion of the lungs, pneumonia, pleurisy; diseases of the urinary organs; contagious diseases, such as pinkeye, distemper, glanders, anthrax, tuberculosis, blackleg.

It is unnecessary to go into the details of the course at any greater length; but sufficient has been printed to show the thorough practical and useful character of the teaching. No charge is made for tuition or for the use of apparatus and materials in the laboratories. The only charge is an incidental fee of 5 dollars. Good board and rooms, including fuel, light, and bedding, can be secured in Columbia at from $3\frac{1}{2}$ to 4 dollars per week, and the entire expense, including the cost of travel, need not exceed 70 dollars.

These are some of the many instances I could adduce of what the American Government does ungrudgingly for the American farmer. Whether in the field or in the school, as a man or a boy, the State looks generously after his training, and sees that he knows his business and puts his talents and opportunities to the best account. How different the condition of absolute neglect shown by the British Government towards Irish farming, and how melancholy to think that it is the protected and favoured American farmer who competes in our own markets with our poor, neglected native farmers, and bit by bit drives out every product of the home farm! With such aids and advantages, with a resourceful, rentless land, protected at

home, encouraged abroad, American farming enters the field of competition against the native industry for which nothing is done, but which is burdened by rent, excessive taxation, and State neglect in every department.

In a cursory review of the efforts made by European governments to help the agriculture of their respective States—a policy adopted by all—I shall first deal with the work done in this respect in Austria. A sum of £350,000 is annually voted to the Minister of Agriculture of that country, and of that amount a sum must for military purposes be applied to the keeping up of a royal stud to supply horses for the cavalry remounts. Practically about £200,000 a year is available, which contrasts markedly with the £1,047,600 which the French Minister has, and the £673,600 which are voted to the Prussian Minister for the same purpose. For nearly twenty years Count Falkenhayn occupied the important post of Minister in Austria with most creditable results to his energy and zeal. He devoted himself to the promotion of technical teaching in agriculture with success. Austria had a chair of agriculture in the University of Prague which was founded so far back as 1791, and even then an attempt was made to organise schools of agriculture for the farmers, but wars, internal troubles, and invasions prevented any systematic attempt in this direction being made until 1868, when the country in some degree settled down. Then a separate Ministry of Agriculture was appointed, Herr Potochi being the first, but in the first eleven years the Minister was changed nine times, until finally in 1879 something of a settled continuity of personality and policy set in. There are now five different kinds of schools of agriculture in Austria. The Agricultural High School in Vienna is a State supported, State directed college where the instruction given is thoroughly scientific. "No student is admitted until he has passed his matriculation examination, and he must remain there three years to obtain a certificate. It is intended specially for the training of teachers and lecturers, and of the managers of large estates." There are sixteen middle

schools, which were established to provide technical education to those who wish to become farmers. Each school is managed by a local committee of agriculturists under the surveillance of the Minister of Agriculture. Twenty-six per cent. of the working expenses of these institutions are paid by the State, while the local authorities contribute fifty-eight per cent., and sixteen per cent. by the agricultural unions—that is, by the local landowners. The lower schools, which are managed and supported in the same way, are intended for the sons of peasant proprietors small farmers, bailiffs, &c. In these the instruction is mainly of a practical character. Not only are boys taught the most recent theories with regard to agriculture, but they are made to apply that knowledge in practice, and they do all kinds of farm work while at school. In addition to these institutions, there are thirty-seven special schools of agriculture, in each of which some special branch is taught, such specialised subjects as hop growing, silk worm rearing vine culture, dairying, gardening, &c. There are also schools of forestry and a state college at Klosterneuburg for the training of fruit growers, and within the past few years classes of agriculture have been founded at six technical high schools. As in America, winter schools are encouraged as being specially suited to farmers, who, relatively to any other have at that period of the year most leisure. These schools are open during the time the winter work on the farm is at a comparative standstill. Whenever possible, an experiment field is attached to each school as it is recognised that mere theory is not so useful as when combined with practical exemplification. These experiment plots are cultivated by State experts, whose duty is not only to show how best certain plants can be grown, but to explain to every person seeking the information the process of culture. Under the control of the Minister of Agriculture are fifteen experimental farms, where a more elaborate form of practical work is carried on to that done in the fields. A laboratory at Vienna is also State supported, where all investigations, analyses, and

scientific inquiries are carried on which bear upon agriculture.

In addition to these educational arrangements, special provision is made for farmers who are either too old or too poor to travel to centres. Agricultural experts are sent about the country—veritable “hedge” schoolmasters—who give gratuitous advice to the small peasant farmers, and instruct them in the best way of cultivating the land or tending their stock. Improved methods are encouraged, and every incentive given to have the farm as productive and well cared as possible. Even grants of money by the State in such necessitous cases of deserving want are given, but this aid usually takes the form of being in kind in the way of seed than in money. The State also comes in to aid higher grade farming by endeavouring to cheapen machinery and seeds, by giving a cow or other animal of better breed, and by a free grant of seed—not much in quantity, no doubt, but sufficient in the individual case to enable the farmer to tide over a temporary distress. The help is given directly and immediately, and where and how it is most wanted. The Austrian Government by purchasing prize stock in other countries endeavours to improve the native breed of cattle, and these are lent out or hired out on very easy terms. Free grants of bulls are made to farmers, who undertake to keep them for four years for the benefit of the district, and Yorkshire boars were some time ago similarly distributed, and disposed of at half price.

In the Tyrol, prize donkeys are sold under cost price. Every attempt is made to help local industries connected with agriculture. Many instances of this solicitude might be given, but we shall cite two. It was found that the oil produced in Dalmatia was inferior to that of Italy, and that it was losing its market by reason of the ignorance of the peasants in the handling of the olives. The Austrian Minister of Agriculture brought over experts from Italy, who taught the people of Dalmatia the proper system of treatment, and these instructors were sent into every village, with the result that the trade was saved. The flax

industry showed signs of declining, through a deterioration of the seed, such as occurs in the north of Ireland. But the Austrian Minister at once got the best Russian seed, and it was given to the small farmers cheap, and even for nothing to those who could not afford to buy it. The English idea of letting the industry die out could not find favour with the advanced Austrians. In Meravia in one year 163,000 osier cuttings for plantations were given to the basket makers. The silkworm rearers are helped not only by establishing stations where they can obtain advice, but young mulberry trees are planted for their benefit, and the production of silk is twenty times greater than it was some years ago. The cheeses of the Tyrol were, in 1875, so bad that they could not be classified; now they are amongst the best in Europe, and the farmers are improving and the productiveness of the land increasing. Of course, if left to themselves after the English fashion in Ireland, farming would probably have degenerated to a pitiable condition of destitution; but, as I have shown, the State did its duty, and by helping the industry saved it from destructive decline.

Having shown what was done so systematically and successfully in Austria, I shall say a few words about a smaller country, where the conditions of climate and soil are less favourable to the industry, and yet where farming is carried on on enlightened principles of encouragement from the State, and based on scientific principles. In Sweden there are excellent agricultural schools. There are 27 of these *Landbruks Skolor* scattered through the country, besides two agricultural colleges. The students in these schools are required to remain under instruction for two years. The course of study comprises the principles of agriculture and horticulture, the care of domestic animals, the improvement of breeds, drawing, surveying, drainage, carpentry and smithy work, carriage making, forestry, mathematics, agricultural chemistry, meteorology, veterinary surgery, botany, a little of zoology and geology, butter and cheese making, the art of building and making fences and wells. Connected with one of the principal

schools are dairy schools for women, where they go through a year of butter and cheese making. The students after passing their examinations may if they like go to an agricultural college for two years more, but most of them return to their parents' farms with a practical knowledge of farming. The instruction in the schools is free, but the students give their labour in return. The expense is partly borne by the State and by the province. The cost at the college, including board and lodging, amounts to about £25 a year. There is a forest institute with six lower schools for the training of practical forestry. A concrete example of the working of the system is given by De Chailler as the result of his visit of inspection to the school at Innerfayle. The director was a doctor of philosophy from the University of Upsala. There were 100 acres under cultivation (the school being but a few years established), but 1,800 acres of unimproved land and forest were being reclaimed. Blacksmith and carpentry shops were in full operation. The live stock consisted of 30 head of cattle, but great attention was paid to the breeding. If the State did not help agriculture in that country we can well inquire how impossible it would be to carry on the industry, and certainly the comfort and absence of poverty to be found in Sweden would not be seen there if the happy go lucky *laissez faire* doctrines of English Governments were to prevail.

No country more closely resembles Ireland in respect of its economic condition, its agricultural industry, its soil, population, resources, and markets than Denmark. It is to-day our chief rival in the bacon and butter export trade in the English markets, and so keen is its competition that, not content with ousting us from English centres, our very shores are invaded by its produce, and Danish butter may be found on sale in the Dublin shops. The high state of perfection to which the agricultural industry, within living memory, has been brought in that once comparatively insignificant little island, with its forbiddingly severe climate, its cold soil, its sparse population, is due absolutely to the action of the State, and the marvellous

success of those efforts within the present generation is the most complete proof and example of the value of such well directed aid. To-day Denmark, with half the existing Irish population (2,200,600), not only feeds itself, but sends abroad annually increasing exports to the value in 1895 of £8,900,869 in butter, eggs, and bacon to the United Kingdom alone. By leaps and bounds the English import trade in these products is increasing, and every year sees redoubled returns; and yet all this is of but relatively recent growth—that of butter within the last twenty-two and that of bacon within the last ten years. A Ministry of Agriculture was established in 1896 in Denmark, but the work transferred to the new office was being efficiently discharged for years before by the Minister of the Interior. The new department now consists of two bureaux—one dealing with State surveys, the other with agriculture, veterinary education, the prevention of cattle disease, the re-forestation of the country, the reclamation of waste lands, and the development of the fisheries. A sum of £108,000 is annually voted for the purpose, but this does not include salaries, office expenses, or certain sums given in support of agricultural education. The money so given is administered through a number of excellent voluntary provincial organisations and local associations. The Royal Danish Agricultural Society is a centralised body, but deriving all its utility, energy, and life from its really national character. There are also federations of the local agricultural societies or provincial unions. There is a society for the cultivation and afforestation of waste lands, also the Danish Fisheries Societies, the Royal Elevage Commission for the furtherance of horse and cattle breeding, poultry raising, and beekeeping, &c., all under the control and co-ordinate with the State department.

The Royal Danish Agricultural Society bears no resemblance in its constitution or utility to the institution with a similar name and pretensions in Ireland. It is more in touch with the country, more active in its work, up-to-date in its ideas, and more national in its constitution. Half its council is elected by the local bodies, and it is

mainly comprised of practical provincials. But behind it as auxiliaries and associated adjuncts are the local agricultural societies, of which there are 101, each consisting of about 500 members, and federated into four provincial unions. They each annually hold congresses in their respective localities, and at these meetings parish and district delegates attend. A better means of popular education and enlightenment could hardly be conceived. The results of these annual representative gatherings are communicated to the Government, and are, where practicable, acted upon, and the suggestions coming with the authority of such practical experience are almost invariably adopted. Denmark, like Ireland, has its co-operative societies in a very efficient condition, and if not co-ordinate with the State system, yet in touch with it, and from it receiving help, aid, and encouragement, and giving it great assistance. They embrace every branch of agriculture. There are (1) co-operative societies for the breeding and rearing of cattle, horses, pigs, poultry, and bees; (2) for dairying and the making of cheese and butter (1,200 alone in number); (3) for bacon curing and slaughtering pigs; (4) for egg collecting and exporting same; (5) for beekeeping and honey making; (6) for fruit gardening and raising of garden plants and horticulture generally. The Government is advised by the Royal Danish Agricultural Society in every step it takes, and it is influenced and directed by its intimate relations and correspondence with the farmers. The system of expert teaching is carried to great perfection in Denmark, and these travelling trainers and teachers are everywhere about the country, not only assisting by their free advice to the local bodies and schools, but helping individual farmers. Every department of agriculture has its expert, and the Government sends them at its own expense into foreign countries to observe and report upon the best methods of farming there adopted. The dairy experts visit the native butter factories, examine and test the churnings. The machinery experts devote their time and thought to seeing the best and most economical articles and instruments used. The cattle experts tell the farmers

the best class of animal to breed and how to treat disease: ultimately the pig experts deal with swine rearing. Abroad the experts are actually diplomatic agents in the service of Danish agriculture, pushing a trade where practicable, sending home reports as to the reasons for any decline in any particular product, which are circulated through the country, and watching every means of developing the export trade.

Besides these invaluable aids, which are in effect the provision by the state of commercial travellers in available foreign markets for the benefit of the Danish farmer, the State provides experimental stations where the different systems of agriculture are tried, the different seeds grown, the different manures tried, and the results of these experiments and investigations, as of all useful information, is conveyed to the local papers, and gratuitously scattered in leaflets and pamphlets broadcast over the land. The people, being an educated and highly intelligent people, very soon utilise these scraps of useful information so freely placed at their disposal. The State also organises a system of schools, and in the lowest and highest grade a specialised training in agriculture is carried out. In a very interesting report prepared by Mr. T. P. Gill for the Recess Committee, and published by them, will be found a detailed account of the working of the State system of grants and aids to agriculture in Denmark. As the competent observer shows, there are numerous ways adopted for training the Danish farmer—"travelling experts in every branch of agriculture, with their constant advice and instruction, experimental stations and experimental laboratories, prizes and lectures at agricultural shows, the system of prizes, travelling grants and advice for the cultivation of small holdings, grants for other branches of the industry, assistance for the education of dairymen and dairymaids, itinerant dairy instruction, and a special scheme of agricultural lectures." In addition to all these helps, the railway and shipping companies are subsidised, encouraged, or compelled, as the case may be,

to carry goods out of the country in a special manner and at special rates. The Government recognise the advantage of local shows, and give grants for the purpose, which are distributed in prizes, and other aids and encouragements. A commission of judges, nominated by the Government, attend, but the local judges, named by the county or district councils, act with them; and, in addition to the State grant, each county council or local representative body votes a sum for prizes also.

The Government also give a grant for the encouragement of the cultivation of small holdings and labourers' allotments, and this annual sum is distributed through the local societies in the way best suited to the individual cases. To some a money prize is given, to others a present of chemical manure or seeds; sometimes it takes the form of a loan for the erection of an outhouse or for drainage, and in such cases the loan is remitted after three years if the work is satisfactorily executed. It often happens the help given takes the form of a grant to enable the man to visit another holding where a superior kind of cultivation suited to his farm is carried on, and his board and lodging for such purpose are paid for. It were easy, did space limits permit, to go into further and more minute details explanatory of the paternal care shown and help given by the Danish Government out of its limited resources to foster and develop the agriculture of that now prosperous country. Nothing can be more gratifying than the results of such a policy. What was at the beginning of the century, and even some thirty years ago, a poor country, with impoverished resources, a famished soil, and famishing people, is now, entirely through those well directed State efforts, the second most prosperous country in Europe. A purely agricultural country, it yet ranks in the national wealth per head of the population next to commercial and manufacturing England, the figures being for England £247 and for Denmark £230 per head. All this and more, for its prosperity is growing, is the consequence and result of the State action by means of its generous and systematic encourage-

ment of agriculture helping that industry. The successful experiment of State help in Denmark affords an example and proof of what must be done in Ireland if its farming is ever expected to be prosperous and its farmers contented.

Probably in no country has more elaborate care been taken by the State to assist liberally agriculture in all its departments than in France, and as the economic conditions of that country are in some sense similar to those existing in Ireland, in so far as they represent a class of small farmers, it may be interesting to give in detail the chief steps so adopted. There are 6,913,000 peasant proprietors in France engaged in the cultivation of 125,000,000 acres, and representing an invested capital in agriculture of £4,000,000,000. For France a sum of £1,703,720, annually voted for the Ministry of Agriculture, and £172,680 for Algiers, representing in all £1,874,240. The department of agriculture comprises four bureaux : (1) Agricultural education, (2) Veterinary education and veterinary services and police, including all measures for the prevention of cattle disease, (3) Encouragement to agriculture, agricultural associations, shows, promotion of legislation, &c., (4) Agricultural statistics. The principle of consultative councils, or committees, seems generally encouraged, so that the general management is as much as possible in touch with the people for whom it is intended, and also is sympathetically worked in their interests. The ministry of agriculture has its superior council of agriculture and a variety of technical committees. The Superior Council acted in connection with agricultural societies established in each "arrondissement," and all the societies in a department elected a Chamber of Agriculture, whom the minister was compelled to consult and be advised by. This system of central and local co-ordination was customary up to 1851, when it was discouraged, but it is being re-established as the most popular and practicable plan. The existing system of agricultural education will be found to be thorough, excellent, and efficient. It consists of these parts:—(1) Higher teach-

ing, which is imparted through the National Agronomic Institute, (2) Intermediate education, given in national schools of agriculture and forestry, (3) Secondary education, represented by practical schools of agriculture, (4) Farm schools and specialised schools, (5) Professors who travel about the country, (6) Example plots and experimental plots, (7) Experimental stations and laboratories; and towards these various schools a sum of £182,000 is annually voted. Special attention is given to the local schools and experimental plots, as being the best means of bringing home to the people the most approved principles of scientific agriculture. The Agronomic Institute in Paris, under M. Tisserand, is a sort of faculty of agriculture intended to train the best agricultural experts and scientists. It has 17 chairs, in which every related subject is taught in the best and most approved manner, and by the ablest teachers in that particular branch. The course lasts two years, and a diploma in agricultural engineering is given to qualified students. Scholarships are available, and the cost of the course is about £20 a year, capable of remission and deduction by intelligent and diligent pupils. At Alfort, Lyons, and Toulouse are three veterinary colleges with efficient staffs and organisations. The sons of large landowners are educated at Grignon, Grandgowan, and Montpellier Schools. The fees are moderate, and the course of instruction is of such a high order that the diploma given at the close of the course is valued among agriculturists. The special subject of dairying is taught at Mamirolle, where plant is erected for the manufacture of all kinds of cheeses, and a course of butter making is taught. At Douai is a school of technical instruction, where such cognate and related subjects as beet root sugar making, brewing, chemical manure making are taught, and even starch and corn flour making, the distillation of essences and perfumes, are not neglected. Needless to add that applied chemistry, mechanics, designing, mathematics are fully taught. Forestry is taught at Nancy, and horse breeding at Le Tin. A stud farm is maintained and everything connected with

the breeding and management of horses taught. Even a supplementary school is attached where grooms are taught.

For the training of efficient gardeners there is a national school established at Versailles, which gives free instruction to extern pupils. There are farm schools, which were attached to schools, and in many respects like the model farms once started in Ireland. Like these institutions, the French farm schools do not seem prospering or popular, and being too theoretical have been giving place to practical schools. Instruction is given on well managed private farms, and a system of prizes organised. There are two sheep farming schools, one silkworm rearing school, 14 cheese making schools, one fishery school, and two primary agricultural schools. The practical schools are not exclusively State subsidized and controlled. They owe their initiative to the local council, and it provides the farm, establishes the school, and appoints a staff of teachers, while the Government pay them, and grant prizes or scholarships. There are instances where the local landowner gives the ground gratuitously, and some where religious communities run the school. The director of these schools is a trained teacher, bearing the diploma of agriculture. The course of education at these provincial schools is eminently useful; it lasts about two years, and the boarders pay about from £16 to £20 a year. As Mr. T. P. Gill says in his report to the Recess Committee as the result of his researches and inquiries into the working of these schools:—"The course is both practical and theoretical. The practical course differs greatly according to locality, it being the rule with these schools to follow out that principle of specialisation and suitability of locality which is aimed at in the organisation of the great regional schools. The aim is to train the pupils in the best forms of cultivation for their own part of the country, and what are likely to be their own holdings when they grow up. The theoretical course is necessarily more uniform in character, and it includes the following subjects:—Agriculture, zootechny, rural economy, and rural engineering,

physics, chemistry, and meteorology ; botany, zoology, geology, horticulture, entomology (useful and noxious insects) ; an upper primary course in civil law, mathematics, surveying and levelling, and book-keeping ; hygiene, and first help to animals."

For girls, practical schools are established where dairying and domestic economy are taught, and a poultry raising farm is at Gambais. There are 8 practical schools for the cultures peculiar to the north and east ; for general agriculture and stock raising there are 8 ; there are two special practical schools for irrigation and drainage, one at Finisterre and the other in Vaucluse ; for horticulture and the cultures peculiar to the Mediterranean region there are 2 schools ; for vine culture there are 7 ; for pasture and dairying districts there are 7. There are 2 schools in Brittany : one practical school of silviculture, a practical school of fish culture, and the poultry school of Gambais. There is also a practical school in Algeria.

A course of agricultural teaching is now obligatory in every primary and upper primary school in rural France, and in the 79,000 of the former and 160 of the latter this is properly insisted on. There are 30 experiment stations and 30 agricultural laboratories. To the stations are attached grounds and stables, and these are mainly supported by the local boards or county councils of the department. The French Government has quite recently introduced a new aid to agriculture—that of appointing agents abroad to keep the government informed of all discoveries and inventions in connection with agriculture. For the propagandis and educative functions of the French ministry is a series of publications forming an annual collection of 27 large volumes of 500 pages. As a further encouragement the French Government established in 1883 an order of agricultural merit, which is bestowed on agriculturists who have realised particularly important improvements, or who by their writings, studies, discoveries, or the discharge of their official duties have done good service to agriculture. This order has a regular

hierarchy of chevaliers, officers, grand officers, &c., like the Order of the Legion of Honour, and is furnished with a special cross and ribbon. These are in brief the measures taken by the French Government for the encouragement and aid of agricultural education in that country.

It would be impossible within the ordinary limits of these communications to go into full detail through the measures and means taken by other countries for the benefit of their agriculture, but it may be taken as a general truth that every country with any pretence to civilisation takes especial care of its agriculture, and does not, like England in its treatment of Ireland, allow the principal industry of the Irish people to be without any State aid. A few examples must suffice.

Holland, despite the difficulties of its situation, devotes a large part of its income and energy to the work of the protection of its agriculture. It has winter schools and itinerant instructors. It provides proof fields and laboratories, and it has an agricultural college at Wageningen and a veterinary college at Utrecht. Its artisan schools are particularly useful, and at Amsterdam there is a school for mechanical engineers and a professional school for girls. It has reclaimed a large part of the peculiarly situated country, and will soon have added 45,000 acres of the Harlem lake to its productive area. Like Ireland, Holland has an abundant supply of turf. It has not found 300 distilleries too many for its export trade. The average size of the farms varies from 20 to 40 acres, and about half the area of the cultivable land is owned by the occupiers, while the rest enjoy an undisturbed fixity of tenure, subject neither to disturbance nor rack rent. The average yield per acre is £7, as compared with £5 5s in England, and to-day the Dutch farmers are, as M. de Laveleye describes them, "well housed, excellently clothed, with tons of gold at their notaries, and public securities in their safes."

In Belgium the State devotes some £112,000 annually to the aid of agriculture, and side by side with these State helps have sprung up co-operative societies, showing here,

as elsewhere, the interdependence of these voluntary and State subsidised organisations. So intense is the system of cultivation pursued that while the twenty million acres in Ireland only yield in products about fifty million pounds' worth, the five million acres in Belgium yield forty-seven million pounds. Their farms average sixteen acres, but the industry of the Fleming is proverbial. He has converted a track of sandy and barren heath into a beautiful garden. Belgium, like Ireland, has its waste lands, but, unlike Ireland, it is fast reclaiming them, showing, as the great economist Laveley says, "that it is only the small cultivator who, spade in hand, can fertilise the waste, and perform prodigies which nothing but his love of the land could accomplish. His day's work he counts for nothing; he spares no exertion, and shuns no trouble."

In the small State of Wurtemberg there is a Bureau of Agriculture, and acting with it an advisory Board popularly elected, and further associated with them sixty-four rural societies. The farms average 22 acres and all owned by peasants. At Hohenheim is a college with a famous school of agriculture, and attached to it a model farm of 680 acres, where experiments in seed growing and the use of machinery are extensively carried on. The farmers' sons have three agricultural schools provided for them; there are also veterinary colleges, seven winter schools, and a system of travelling lecturing under which the masters of each school go among the farmers. These wandering lecturers are paid their salaries and expenses by the State. In consequence of the establishment of these agricultural schools at Wurtemberg, farming, which thirty years ago was deplorable, is now in a most satisfactory and progressive condition, and no better proof of the good results and of the need of technical teaching as applied to farming could be adduced than the example that this little State furnishes. Half the size of Ireland, it supports in comfort half the population of Ireland, and in addition exports large quantities of manufactured articles made by the farmers largely, and among its employers and employed there exist the most cordial rela-

tions. Their farms average fourteen acres, and the people are comfortable, well to do, and happy. The area under crops amounts to about two-thirds of an acre per inhabitant, while in Ireland it is equal to nine-tenths of an acre, and the value of farm products averages 113s per acre, as against 106s in England.

In Switzerland there is a Federal Minister of Agriculture, and each canton has its own minister or director of farming interests. There is a large grant given for agriculture, and, consequently, we find agricultural schools, model farms, dairy schools, winter schools, veterinary schools, &c. An item in the State budgets are grants to agriculture and for the improvement of land and cattle, and aid for the insurance of stock. There are girls' hand work schools, polytechnics, and technical colleges, and a school for watch making. In a diplomatic report Mr. Gould says that "the remarkable prosperity of Switzerland is due to the excellent organisation—financial, industrial, and educational—possessed by the country." The land is freehold, and so easily transferred that the cost of registration and transfer only amounts to 14s per £100. The average yield per acre is £26, giving each farmer an average capital of £600.

In Bavaria there is a Bureau of Agriculture, and an agricultural association advising its operations. There are agricultural schools in every district; winter schools, the teachers of which travel in summer through the country; work schools for boys and girls, where every incidental industry to farming is taught by the State and industrial academies. The land banks are an institution of the country. They are helped by the Government to aid the expenses of management. Bavaria has a denser population than France (195 inhabitants per square mile), and the secret of its prosperity seems to be the combination of home industries with farming.

Hungary for its Ministry of Agriculture provides a sum of £1,700,000 annually. There are 28 haras or stud stations, maintained at a cost of £240,000, and a number of cattle farms, where the best available class of sheep, cows,

and pigs are kept and bred. For land improvement a large amount is allowed every year, and to encourage the enterprise the State provides engineers who give their advice and services free. Veterinary surgeons are also provided free for the farmers. The State in 1890 established 12 peasant colonies to relieve congestion and check emigration. Vineyards are helped and dairy schools established, and everything done to assist the farmer.

In Austria, according to Mr. Mulhall's able report to the Recess Committee, there is a ministry of agriculture and a department for distributing subsidies for land improvement, inspecting agricultural schools, giving lectures, &c. There are numerous agricultural and horticultural schools provided, veterinary colleges, work schools for girls. The average yield per acre is 88s, as compared with 73s in Ireland. The farms average seventeen acres, and each peasant farm produces about £60 a year and supports eight persons. The "system of school workshops inaugurated by the Austrian Government is the most complete in Europe."

These examples prove demonstrably that it is impossible for farming without State aid under modern conditions, even in countries where protection prevails, to prosper, but that it is certain to do so with generous State aid. That aid must take many forms. I have shown that in France in the rural schools elementary instruction in agriculture is compulsory, and from the age of seven every child attending the commune schools is taught those principles of agriculture which, when he grows up to be the occupier of his land, he will be able to put into practice upon it. The teaching is of a two-fold character—by text books and by simple experiment and observation. The Minister of Public Instruction says on the subject:—"The end to be attained by elementary instruction in agriculture is to give the greatest number of children in rural districts the knowledge indispensable for reading a book on modern agriculture or attending an agricultural meeting with profit; to impress them with the love of country life, and the desire not to change it for the city

or manufactures, and to inculcate the truth that the agricultural profession—the most independent of all—is more remunerative than many others for industrious, intelligent, and well instructed followers.”

The inculcating of these practical principles in these days in an agricultural country is most essential, for if it is left to the policy of “laissez faire,” adopted alone in these countries, agriculture is sure to decline. To this practical system of elementary instruction in agriculture France mainly owes its relative agricultural prosperity, and that it can still produce sufficient food for its people’s wants. To the perfection Denmark has brought its agricultural training is that prosperous little country indebted for its splendid position of progress to-day. In the Danish rural high schools peasants of from eighteen to thirty years of age spend five months of the winter and women three months of the summer receiving an education which has been described as one which “leans chiefly on the human side, and gives but a secondary place to the scientific and technical side, the object being to develope the heart, mind, and will.” America does not regard its marvellous manufacturing progress as sufficient, but with true common sense and patriotism strives by the inducement of instruction and the encouragement of example to make agriculture a popular and profitable pursuit. With the practical prudence of protectionism it fosters its farming industry as I have shown.

So far back as 1862 colleges for the benefit of agriculture were established by Act of Congress, and again in 1890 these institutions were further endowed by grants of the public lands and the proceeds arising from their sale. These two sources of revenue, amounting to about 1,500,000 dollars, do not represent the whole amount of the income set apart for the encouragement of agriculture; other sources are fees, state grants, &c., in the whole amounting to 5,250,000 dols., or over one million pounds. There are now fifty colleges in America where agriculture is taught, and no country seems to be without State aids for higher teaching. The English Board of Agriculture largely subsidises

colleges that teach agriculture, and a proposal is now made to establish a chair of agriculture at the University of Cambridge.

All these efforts made by every country, these well sustained and liberally subsidised grants to agriculture, should make it plain that some such form of active help must be extended to Ireland if it is not to become a waste and its people wanderers. Considering the unpractical character of the primary education taught in the rural schools, the absence of any aid to instruction in agriculture, the absence of any real help from the State to those engaged in its pursuit, the ever recurring troubles connected with the occupation of the land, the unrest of its peculiar agrarian settlement, the want of cheap transport, the growing burdens on the land, it is marvellous how an acre of Irish land pays for its cultivation.

The condition of Irish agricultural affairs, however, is alarming, and if the present decline continues it will become irremediable. The number of holdings in 1891 was 486,865, with a mean valuation of £20, and of these 475,376 are valued at £4 and under, while of those over £4 and under £12 valuation there are 266,399. The population has been allowed to run down from 8,175,124 in 1841 to 4,585,369 in 1897. Last year alone 32,995 persons emigrated, or since 1891 3,722,658. The number of inhabited houses has run down from 414,551 in 1841 to 326,547 in 1891, and the number of families from 1,128,300 in 1861 to 923,113 in 1891. The producers are thus becoming fewer year by year, while the area of production is also diminishing.

The extent of land under crops in 1878 was 5,204,000 acres, and in 1897 it declined to 4,745,000, or a decrease of 459,000 acres in 19 years. Wheat declined from 54,990 acres in 1893 to 52,862 in 1895, oats in the same period from 1,248,338 acres to 1,165,295 acres, barley from 182,432 acres to 170,535 acres, potatoes from 723,735 acres to 664,912 acres, and in five years from 1893 to 1898 the total decrease in land under cultivation dropped from 4,878,041 acres to 4,707,749 acres, or a fall

of 170,292 acres in five years. There has been thus a steady decline in the amount of products as in the number of producers.

Even if Ireland were not considered at all in the matter, England's interest should induce its rulers to help Irish farming as the governments of every other country help their particular industry, with the marked successful results I have endeavoured to describe and explain. That success, gained by such means, should encourage and stimulate the effort of the Government to similar help in this country, where agriculture is yet so largely the occupation of the people and their main dependence. The marvellous increase within recent years under unfavourable conditions of growth of the co-operative movement in Ireland, and the interdependence of such aid to self help with any State directed efforts, should be an additional reason to induce the Government to do something. These co-operative movements supply an auxiliary machinery, and prove to the world the capacity for organisation and self help and the intelligence of the Irish peasantry, which qualities being so shown make it certain that any properly endowed and fully equipped measure for establishing a board of agriculture in Ireland will surely succeed.

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A Board of Agriculture for

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